

GUIDELINES AND RESOURCES

Interim Guidance for Necropsy and Animal-Specimen Collection for Laboratory Testing

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The Centers for Disease Control and Prevention (CDC) is working with local and state health departments and public health laboratories to test specimens from humans and some animals with suspect monkeypox infection. These interim recommendations provide guidance to necropsy personnel on the safe performance of necropsies and collection of animal specimens for monkeypox testing.

CDC will consider testing specimens from animals with suspect monkeypox on a case-by-case basis. For [more information on what types of specimens](#) may be considered,

All animal necropsy procedures require adherence to standard precautions with use of appropriate personal protective equipment (PPE) and facilities with appropriate safety features. Animal necropsy procedures can generate fine-particle aerosols that may contain infectious organisms. Thus, PPE should include both protective garments and respiratory protection as outlined below.

Smallpox Vaccination

Personnel who are conducting the necropsy should have an up-to-date smallpox vaccination (within 3 years). For guidance regarding [smallpox vaccination see this page](#).

Personal Protective Equipment for Necropsy Personnel

Personnel who handle animals should wear PPE and follow recommended guidelines, including:

- **Protective garments:** These include disposable gloves; disposable impervious gown or coverall with cuffed sleeves; eye protection (e.g., tight-fitting goggles or face shield).
- **Respiratory protection:** These include N-95 or N-100 respirators or powered air-purifying respirators (PAPR) equipped with a high-efficiency particulate air (HEPA) filter. PAPR is recommended for any procedures that result in mechanical generation of aerosols, e.g., use of oscillating saws. Necropsy personnel who cannot wear N-95 respirators because of facial hair or other fit-limitations should wear PAPRs. [For detailed information on respirator programs, including fit test procedures](#).
- **Careful hand and skin hygiene:** Hands should be properly washed after removal of PPE and gloves and especially before touching the eyes or mucosal surfaces. See CDC's infection-control page for guidance for workers who have unprotected exposures to animals with [suspect monkeypox or laboratory specimens from these animals](#)

Laboratory Specifications for Necropsy

Veterinarians should consult with their state health department to identify laboratories that can obtain and process specimens under appropriate biosafety conditions. Necropsies should be performed using a certified Class II Biological Safety Cabinet (BSC) in a Biosafety Level 2 laboratory. Special care should be taken to avoid the production of infectious aerosols. The use of sealed rotors and safety cups are encouraged for centrifugation of monkeypox specimens. Rotors or safety cups should be opened in a BSC after centrifugation involving monkeypox specimens. In cases where appropriate necropsy facilities are not available in a state, state health department officials may consult with the CDC Monkeypox Animal/Quarantine Team (770-488-7100) to discuss submission of whole frozen carcasses.

Necropsy Procedures

- **Prevention of percutaneous injuries:** All sharps should be carefully handled, including never recapping, bending or cutting needles, and ensuring that appropriate sharps containers are available.
- **Procedures:** The number and extent of procedures should be minimized, both to decrease opportunities for worker risk, and to decrease potential for environmental contamination. Perform necropsies only to the extent required to obtain needed information. Omit examinations that generate aerosols and increase the risk of environmental contamination, e.g., use of oscillating saws to open the skull.

Necropsy Specimens

If desired, serum (red-top or tiger-top tube) may be collected prior to animal euthanasia. During necropsy, all organs demonstrating gross pathology should be sampled. At a minimum, necropsy specimens should include the following:

- liver
- lungs
- spleen
- lymph node
- kidney
- gonads
- skin lesions (if present)

Tissues should be divided into two parts. The first half should be placed in 10% formalin and kept at room temperature. Do not freeze the formalin-fixed specimen. The second half should be collected by using appropriate sterile technique and placed in a sterile 1.5- to 2-mL screw-capped plastic vial with O-ring. Do **not** add transport medium. If shipment occurs within 24 hours, refrigerate this tissue sample; otherwise, freeze this specimen. A full report of the gross pathology findings should accompany necropsy specimens submitted for testing.

Specimen Packaging and Shipping

Specimens should be submitted through the state health department laboratory. The state laboratory should coordinate the shipments of all animal specimens with their

state veterinarian to ensure compliance with local, state and federal animal regulations.

Serum, tissues and other diagnostic specimens should be packaged, labeled and shipped as [outlined CDC specimen packaging and transport page](#).

Disinfection and Disposal of Animals and Animal Bedding and Caging

All disposable waste generated from the autopsy should be autoclaved or incinerated. Carcasses from animals that are considered suspect, probable, or confirmed monkeypox cases should be disposed of according to state-specific guidelines. CDC recommends incineration or autoclaving of these carcasses prior to burial or disposal in landfills. Similarly, bedding should be incinerated or properly autoclaved before disposal. Caging should be autoclaved or cleaned and disinfected with an EPA-registered hospital-grade detergent disinfectant.

Environmental Cleaning

Following the necropsy procedure, all surfaces should be thoroughly cleaned and disinfected with 0.5% sodium hypochlorite or other EPA-approved high-level disinfectant. All reusable necropsy equipment should be cleaned and disinfected according to standard laboratory procedures. After completion of the necropsy and specimen collection, all non-reusable specimen collection and barrier protection materials should be placed in biohazard bags and incinerated or autoclaved prior to disposal.